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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/721,616	11/24/2003	Seiji Sugiura	TOW-051	5616

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LAHIVE & COCKFIELD, LLP
ONE POST OFFICE SQUARE
BOSTON, MA 02109-2127

EXAMINER	
LEWIS, BEN	
ART UNIT	**PAPER NUMBER**
1745	

MAIL DATE	DELIVERY MODE
09/20/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/721,616	SUGIURA ET AL.	
	Examiner	Art Unit	
	Ben Lewis	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-6 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-6 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 24 November 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 21st, 2007 has been entered. Claims 1 and 6 have been amended.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

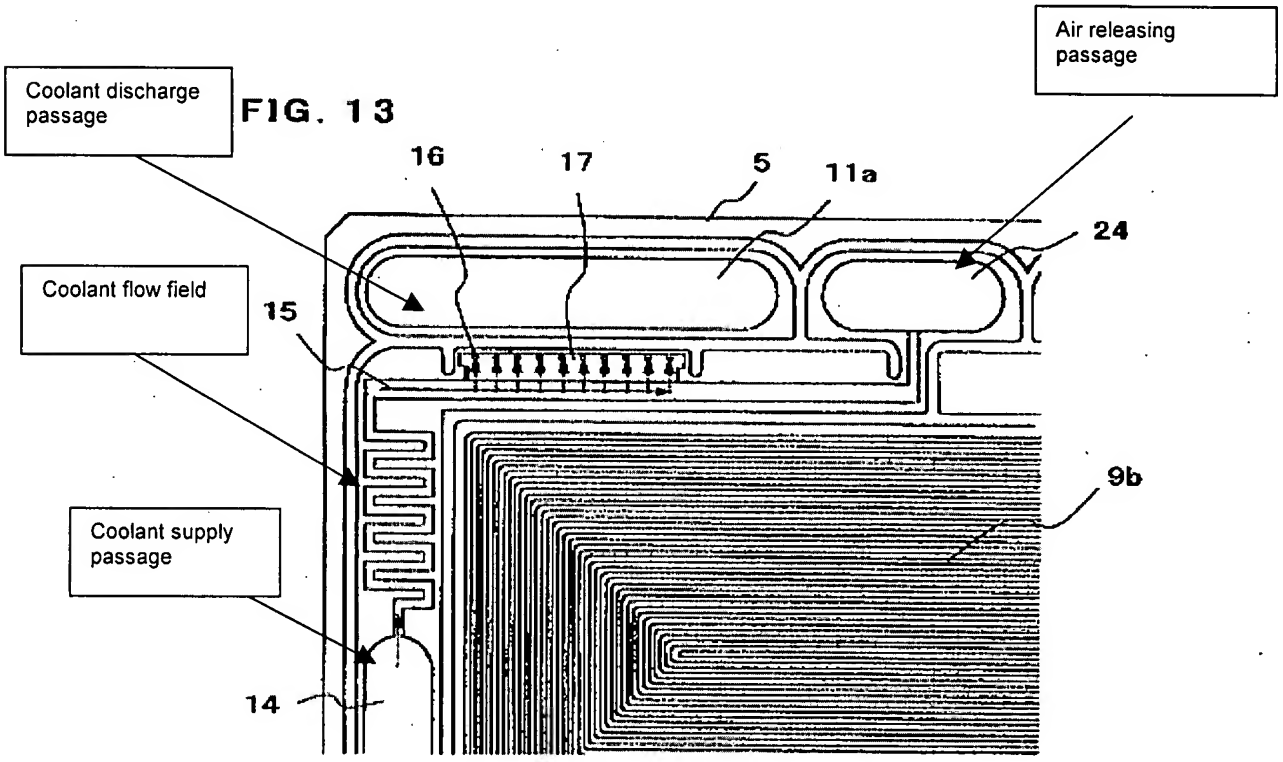
> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claim 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogami et al. (U.S. Pub. No. 2003/0064266 A1).

With respect to claims 1 and 4, Ogami et al disclose a polymer electrolyte fuel cell stack and method for operating the same and gas vent valve wherein fuel cell stack comprises membrane electrode assemblies **(3)** in which gas diffusion electrodes **(2a, 2b)** are arranged on both sides of an ion exchange membrane **(1)** and a reactant gas supply separators **(5)** interposed between the membrane electrode assemblies **(3)**. The

reactant gas supply separators **(5)** each has a first surface having first reactant gas supply grooves **(9a)** for supplying first reactant gas, a second surface having second reactant gas supply grooves **(9b)** for supplying an second reactant gas, and water supply means for supplying water to the first reactant gas supply grooves **(9a)** (See abstract). Ogami et al also teach that the present invention is related to a polymer electrolyte fuel cell stack, and more specifically to a fuel cell stack structure for uniformly distributing mixed fluid of fuel gas and water "coolant" to each fuel cell unit in a polymer electrolyte fuel cell stack utilizing latent heat cooling with supply of water to reactant gas (Paragraph 003). FIG. 13 shows the gas vent hole **24** and its vicinity in the reactant gas supply separator **5**, seen from the oxidant gas supply surface. The gas vent hole **24** is connected to the buffer section **17**. As shown in FIG. 14, the fastening end plate **21** of the fuel cell stack **10** formed with the reactant gas supply separators **5** described above is equipped with and connected to a gas vent pipe **25**. A valve **26** is connected to the gas vent pipe **25** for selectively venting and blocking the gas vent holes **24** (Paragraph 0127). In the sixth embodiment described above, the valve **26** may be operated to open to communicate the gas vent holes **24** to the atmosphere when the water is supplied during the start-up operation of the fuel cell stack **10**, so that gas remained in the buffer sections **17** may be vented. Typically, water supply is stopped when the power generation by the fuel cell stack **10** is stopped. At that time, bubbles in the water passages to the communication holes **16** may be removed, because the water held below the communication holes **16** is remained there and the water supply manifold **14** is positioned below the buffer sections **17** (Paragraph 0128). On the other hand, the

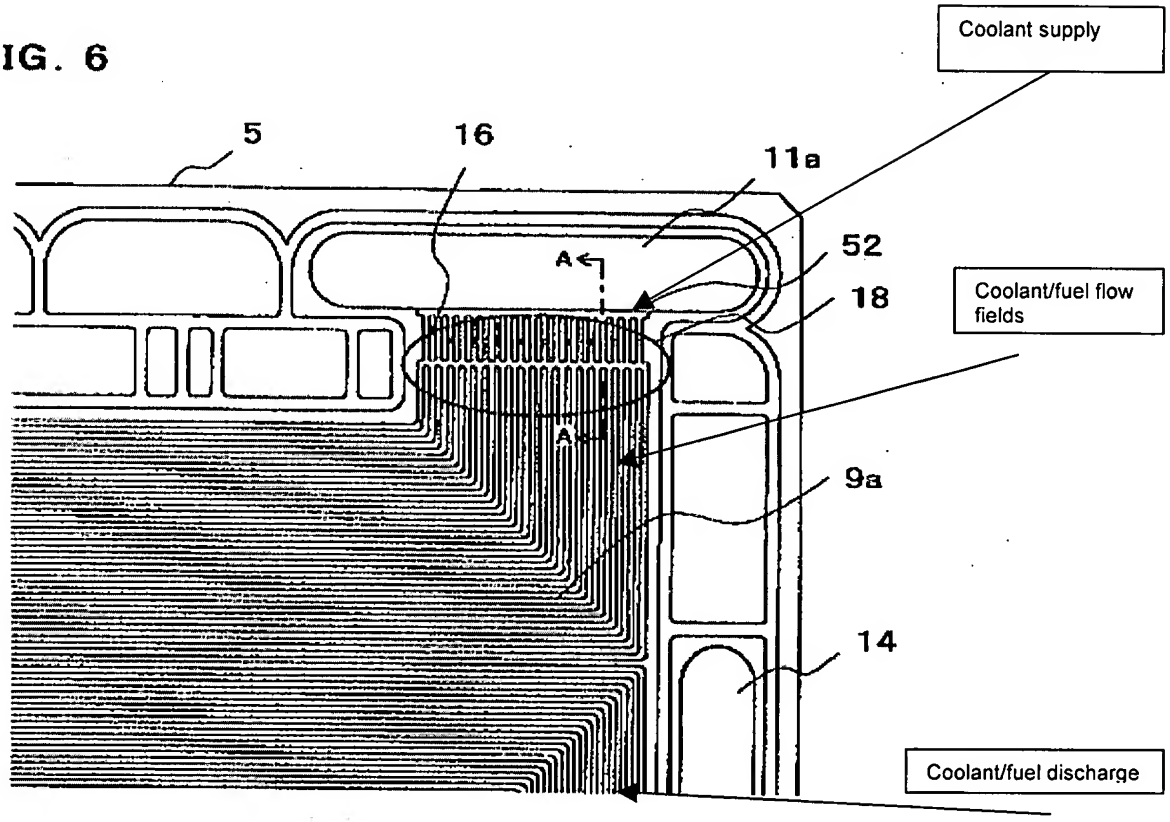
water held above the communication holes **16** is drained through the communication holes **16** to the fuel gas supply grooves **9a**. In the sixth embodiment, the gas bubbles which may be present above the communication holes **16** can be fully vented in a short time by venting the residual gas in the buffer sections **17** through the gas vent holes **24** "air releasing passage" (Paragraph 0129) (See Fig. 13).



Also, it is noted that the fuel passages of Ogami et al. also function as coolant flow fields since the fuel passages contains both coolant and fuel. Since Ogami et al teach that the fuel gas branched from the fuel gas supply manifold 11a and the water branched from the water manifold 14 are mixed in the fuel gas introductory portion 18

and then flow through the fuel gas supply grooves 9a as two-phase flows (Paragraph 0092) (See Fig. 6).

FIG. 6



With respect to the coolant supply passage being provided at a middle position of one end of said separator and coolant discharge passage is provided at a middle positon at the other end of said separator presents no novel or unexpected result over the location of the coolant supply and discharge passages in the Ogami et al. reference. The positioning of the coolant supply and discharge passages in lieu of those used in the references solves no stated problem and would be an obvious matter of design

choice within the skill of the art. In re Launder, 42 CCPA 886, 222 F.2d 371, 105 USPQ 446 (1955); Flour City Architectural Metals v. Alpana Aluminum Products, Inc., 454 F. 2d 98, 172 USPQ 341 (8th Cir. 1972); National Connector Corp. v. Malco Manufacturing Co., 392 F.2d 766. 157 USPQ 401 (8th Cir.) cert. denied, 393 U.S. 923, 159 USPQ 799 (1968).

With respect to claims 2 and 3, Ogami et al teach that bubbles in the water passages to the communication holes **16** may be removed, because the water held below the communication holes **16** is remained there and the water supply manifold **14** is positioned below the buffer sections **17** (Paragraph 0128). On the other hand, the water held above the communication holes **16** is drained through the communication holes **16** to the fuel gas supply grooves **9a**. In the sixth embodiment, the gas bubbles which may be present above the communication holes **16** can be fully vented in a short time by venting the residual gas in the buffer sections **17** through the gas vent holes **24** "air releasing passage" (Paragraph 0129).

With respect to claims 5 and 6, Ogami et al disclose a polymer electrolyte fuel cell stack and method for operating the same and gas vent valve wherein fuel cell stack comprises membrane electrode assemblies (3) in which gas diffusion electrodes (2a,2b) are arranged on both sides of an ion exchange membrane (1) and a reactant gas supply separators (5) interposed between the membrane electrode assemblies (3). The

reactant gas supply separators (5) each has a first surface having first reactant gas supply grooves (9a) for supplying first reactant gas, a second surface having second reactant gas supply grooves (9b) for supplying an second reactant gas, and water supply means for supplying water to the first reactant gas supply grooves (9a) (See abstract). (See Fig. 5). Now, the fuel gas supply surface of the reactant gas supply separator 5 is explained referring to FIG. 5. The fuel gas supply grooves **9a** are formed for fuel gas flowing there through in the central part of the reactant gas supply separator **5**. FIG. 5 shows the opposite side of the reactant gas supply separator **5** shown in FIG. 3. Therefore, the locations of the manifolds **11a** and **11b** for fuel gas, the manifolds **12a** and **12b** for oxidant gas and the water supply manifold **14** in the marginal portions are in the opposite side in left and right sides when FIGS. 3 and 5 are compared (Paragraph 0091) (See Fig. 5).

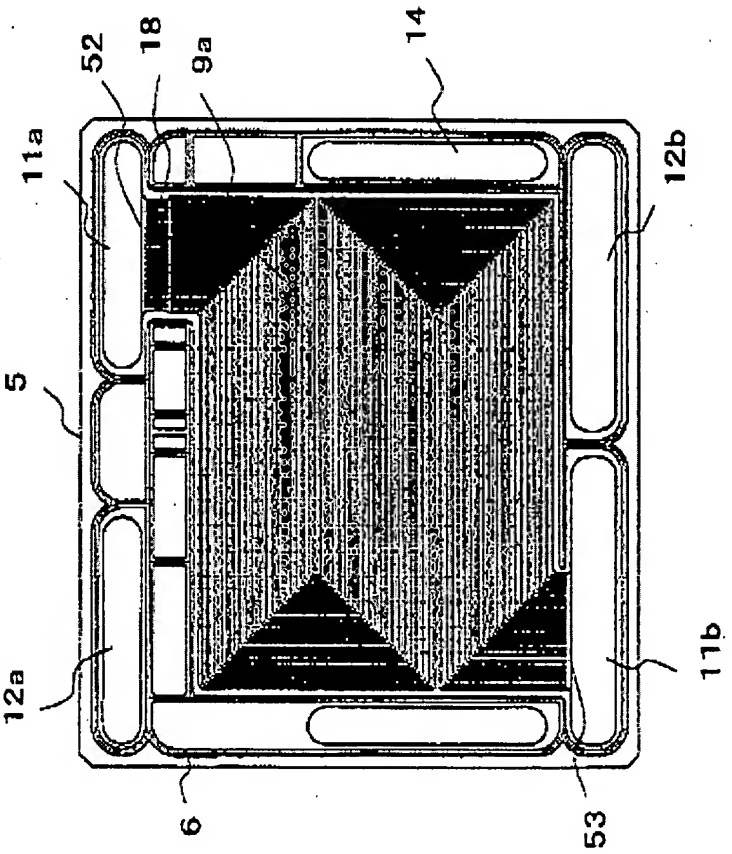


FIG. 5

Response to Arguments

3. Applicant's arguments filed on June 21st, 2007 have been fully considered but they are not persuasive.

Applicant's principal arguments are

(a) Applicants respectfully submit that the Ogami reference does not disclose the limitation that "said coolant flow field is in fluid communication with said coolant supply

passage, said coolant discharge passage and said air-releasing passage on a single surface of said separator," as recited in claim 1.

(b) Additionally, Applicants submit that the Ogami reference does not disclose the limitation that "said coolant supply passage is provided at a middle position of one vertical end of said separator, and said coolant discharge passage is provided at a middle position of the other vertical end of said separator," as recited in claim 1.

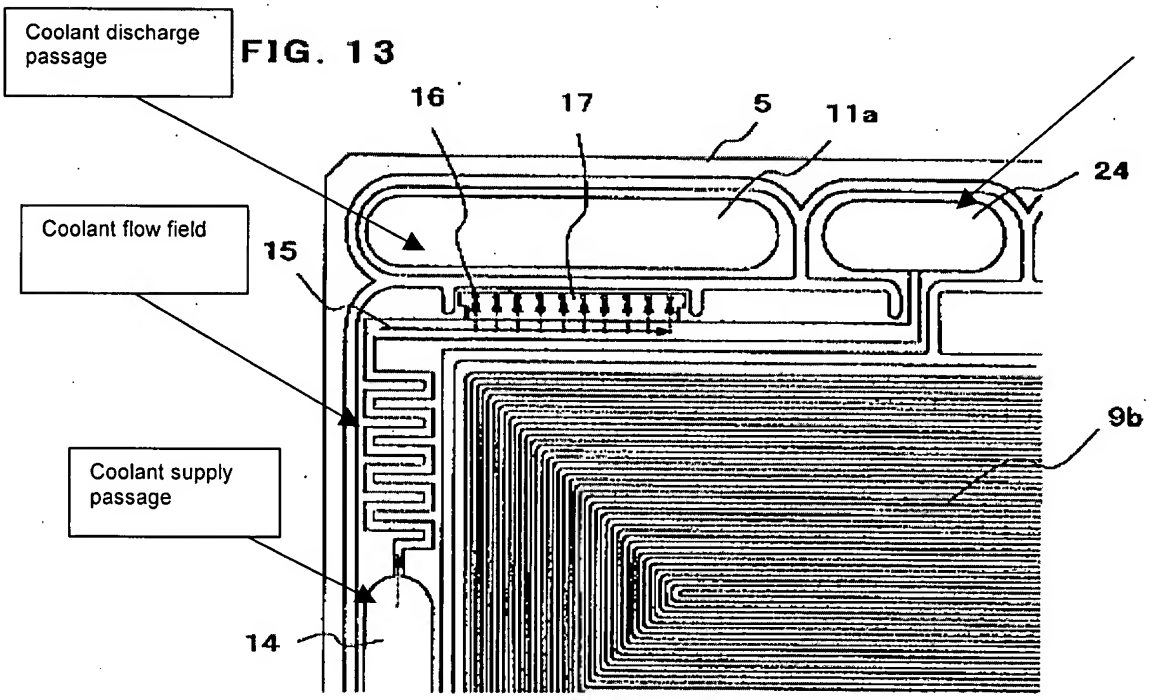
(c) Furthermore, Applicants submit that the Ogami reference does not disclose the limitation that "said separator includes first and second metal plates which are stacked together, and said coolant flow field is formed between said first and second metal plates," as recited in claim 4.

In response to Applicant's arguments, please consider the following comments.

(a) Ogami et al also teach that the present invention is related to a polymer electrolyte fuel cell stack, and more specifically to a fuel cell stack structure for uniformly distributing mixed fluid of fuel gas and water "coolant" to each fuel cell unit in a polymer electrolyte fuel cell stack utilizing latent heat cooling with supply of water to reactant gas (Paragraph 003). FIG. 13 shows the gas vent hole **24** and its vicinity in the reactant gas supply separator **5**, seen from the oxidant gas supply surface. The gas vent hole **24** is

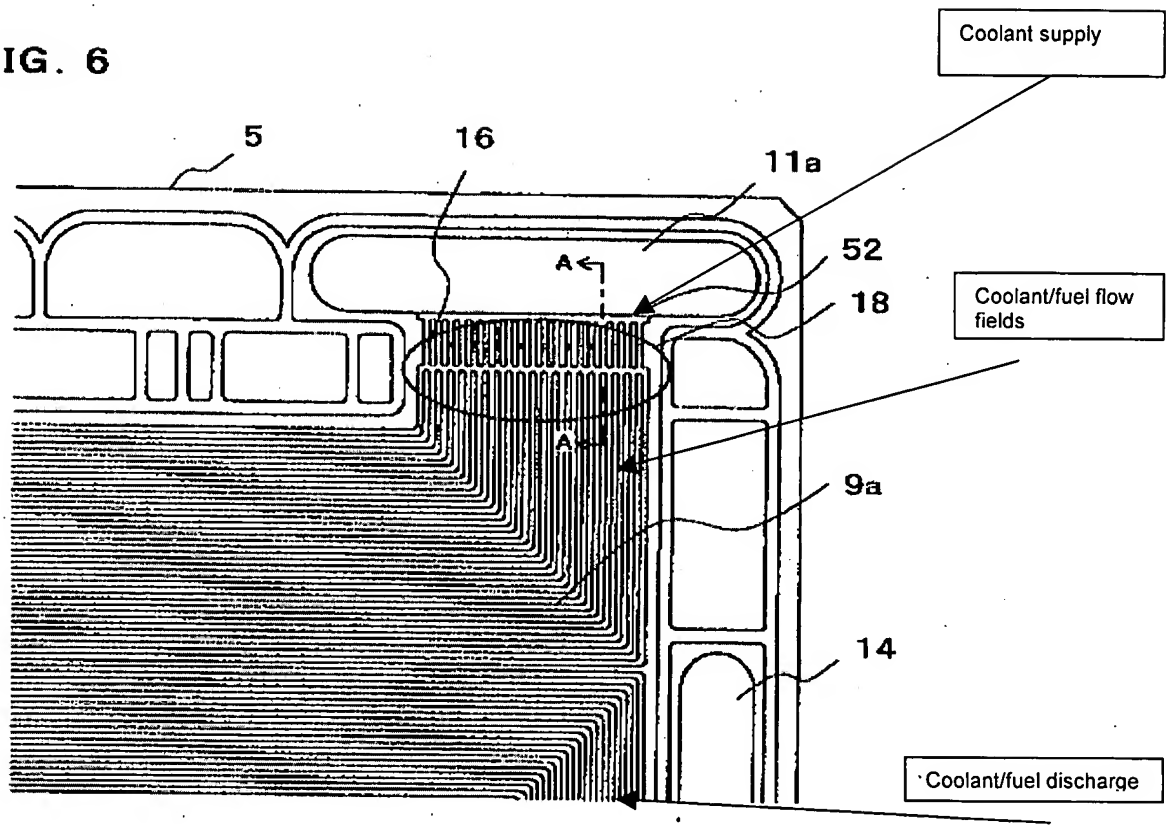
connected to the buffer section **17**. As shown in FIG. 14, the fastening end plate **21** of the fuel cell stack **10** formed with the reactant gas supply separators **5** described above is equipped with and connected to a gas vent pipe **25**. A valve **26** is connected to the gas vent pipe **25** for selectively venting and blocking the gas vent holes **24** (Paragraph 0127).

FIG. 13



Also, it is noted that the fuel passages of Ogami et al. also function as coolant flow fields since the fuel passages contains both coolant and fuel. Since Ogami et al teach that the fuel gas branched from the fuel gas supply manifold 11a and the water branched from the water manifold 14 are mixed in the fuel gas introductory portion 18 and then flow through the fuel gas supply grooves 9a as two-phase flows (Paragraph 0092) (See Fig. 6).

FIG. 6



(b) With respect to the coolant supply passage being provided at a middle position of one end of said separator and coolant discharge passage is provided at a middle positon at the other end of said separator presents no novel or unexpected result over the location of the coolant supply and discharge passages in the Ogami et al. reference. The positioning of the coolant supply and discharge passages in lieu of those used in the references solves no stated problem and would be an obvious matter of design choice within the skill of the art. In re Launder, 42 CCPA 886, 222 F.2d 371, 105 USPQ 446 (1955); Flour City Architectural Metals v. Alpana Aluminum Products, Inc., 454 F. 2d 98, 172 USPQ 341 (8th Cir. 1972); National Connector Corp. v. Malco

Manufacturing Co., 392 F.2d 766. 157 USPQ 401 (8th Cir.) cert. denied, 393 U.S. 923, 159 USPQ 799 (1968).

(c) Ogami et al disclose a polymer electrolyte fuel cell stack and method for operating the same and gas vent valve wherein fuel cell stack comprises membrane electrode assemblies **(3)** in which gas diffusion electrodes **(2a, 2b)** are arranged on both sides of an ion exchange membrane **(1)** and a reactant gas supply separators **(5)** interposed between the membrane electrode assemblies **(3)**. The reactant gas supply separators **(5)** each has a first surface having first reactant gas supply grooves **(9a)** for supplying first reactant gas, a second surface having second reactant gas supply grooves **(9b)** for supplying an second reactant gas, and water supply means for supplying water to the first reactant gas supply grooves **(9a)** (See abstract).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ben Lewis whose telephone number is 571-272-6481. The examiner can normally be reached on 8:30am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ben Lewis

PATRICK JOSEPH RYAN
SUPERVISORY PATENT EXAMINER

Patent Examiner

Art Unit 1745